Amendments to the Drawings:

The attached sheet of drawings indicates changes to Fig. 2 and replaces the original sheet included Fig. 2.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

REMARKS

This amendment is intended to replace the nonresponsive amendment previously submitted. As proposed by the Examiner, the claims have been returned to the dependent form of the original filing and all changes are with reference to the claims as originally submitted.

I. Claim Objections

Claims 3, 8, 10, and 18 are objected to because of various formalities.

In claim 3, the claim element "the control network communications module" is said to lack antecedence. This claim element has been amended to --the control network communications program-- which is supported by claim 1.

In claim 8, the claim element "the web server" is said to lack antecedence. This claim element has been amended to --web server program-- which is supported by claim 1.

In claim 10, the claim element "the group" is said to lack antecedence. This claim element has been amended to --a group--.

In claim 18, the claim element "the communication of signals" is said to lack antecedence. This claim element has been amended to recite --communication of signals--thereby overcoming the rejection.

Withdrawal of the objections to the claims is therefore respectfully requested.

II. Claim Rejections

Claims 1 through 8 and 14 through 19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Thibault in view of Stawikowski.

Internet communications require software that can implement a number of simultaneous protocols. Each of these protocols is usually described as a "layer" (e.g., physical layer, data layer, network layer, transport layer and application layer). These layers and their names are well known in the art and listed usefully in the attached web page from (www.protocols.com/pbooks/tcpip1-htm). Generally, IP is an Internet "network layer" protocol and, TCP and UDP are Internet "transport layer" protocols. FTP and HTTP are common "application layer protocols".

The present invention is intended to make a flexible Internet interface to control devices (such as I/O modules) possible even though the control devices cannot support all the protocols necessary for Internet communications. The solution of the present invention is to allow the control devices to run only the application layer of Internet communication (i.e. web page HTTP) and to move the transport layer protocol and a network layer protocol (e.g., TCP/IP) to a central device. When Internet data comes in, the central device strips off the HTTP and, forwards it to the control devices using the standard industrial control communication protocol built into the control devices. See generally, page 4 of the present application, first paragraph, and page 5, lines 5-10.

As noted by the Examiner, Thibault discloses an industrial control system providing for web access to "control devices". In Thibault, the individual "control devices" do not include web server programs (e.g. the application layer program) so they cannot accept Internet communications directly, but Stawikowski teaches that UDP/IP (Internet transport and network protocol) can be used to communicate with various control devices.

The Applicant agrees that the device proposed by the Examiner (one that communicates with the web via TCP/IP and then translates this to UDP/IP to communicate with control devices) would fall within the literal language of claim 1. This coverage is unintentional, however, because the proposed device clearly would not provide the intended benefit of the present invention in eliminating the overhead of the transport and network layer protocol of TCP/IP (or in this case UDP/IP). Accordingly, the Applicant has amended claim 1 to indicate that the communication with the web access interface must use an Internet transport and network layer protocol while the communication with the control devices must not use an Internet transport and network layer protocol. Support for this limitation is found in the specification's descriptions of TCP/IP which are Internet network and transport layer protocols.

The significance of this limitation is that each control device may hold only application layer data and thus be wholly self contained with respect to the data it exchanges with a browser on the Internet. In contrast, the device described in

Thibault requires the creation and downloading of new objects to the object manager 25 as new control devices are added to the control system. The objects are necessary to interpret data held in the control devices as application layer data readable by a browser. While Thibault recognizes that it is impractical for the control devices to hold an entire Internet stack (network, transport and application layers), Thibault fails to recognize that a portion of the stack (the application layer) can in fact be efficiently held in the control devices and, that this eliminates the need to reprogram a central object manager for each new object that is developed for new control devices.

In light of this amendment, it is believed that claim 1 and those claims dependent on claim 1 are now allowable over the combination of Thibault and Stawikowski which fails to teach communication of socket API data (application layer data) from the control devices to a web access interface without using an Internet transport layer protocol and an Internet network layer protocol.

Claim 18 has similarly been amended to indicate that the signals received by the "first means" must be formatted in accordance with the IP protocol (a network layer protocol) while the signals sent to the control device cannot be formatted in accordance with the IP protocol. Thus, the proposed combination of Thibault and Stawikowski in which TCP/IP is translated into UDP/IP would not anticipate these claims since both use IP. Nor would this combination meet the goal of eliminating the need for network layer and transport layer programs in each of the individual devices (because both TCP/IP and UDP/IP are network and transport layers), something which would require excess memory and processing capability beyond the typical control devices at this time.

In light of this amendment, the combination of Thibault and Stawikowski would not anticipate claim 18 and, in fact, teaches away from the claims by proposing a system which does not provide the benefit of the present invention. Accordingly, it is believed that claims 18-20 are therefore allowable.

Claim 21 requires that the socket API data be extracted from the TCP/IP protocol on the Internet and retransmitted to the control devices using a control network protocol, for example, DeviceNet or ControlNet as listed in the present

application. Stawikowski teaches retransmission of this data in UDP/IP protocol which is an Internet protocol and not a control network protocol. Accordingly, the combination of Thibault and Stawikowski would not anticipate claim 21 nor claims 22-23 as dependent on claim 21.

For the reasons described above, it is now believed that claims 1 through 23 are in condition for allowance and allowance is respectfully requested.

Respectfully submitted,

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TCP / IP Reference Page

Protocols according to layers

Click here to view protocols route map

Shortcuts to popular Protocols

IP	Internet Protocol version 4
IPv6	Internet Protocol version 6
TCP	Transmission Control Protocol
UDP	User Datagram Protocol

The Defense Advance Research Projects Agency (DARPA) originally developed Transmission Control Protocol/Internet Protocol (TCP/IP) to interconnect various defense department computer networks. The Internet, an international Wide Area Network, uses TCP/IP to connect government and educational institutions across the world. TCP/IP is also in widespread use on commercial and private networks. The TCP/IP suite includes the following protocols

Data Link Layer

ARP/RARP	Address Resolution Protocol/Reverse Address
DCAP	Data Link Switching Client Access Protocol

Network Layer

DHCP	Dynamic Host Configuration Protocol
DVMRP	Distance Vector Multicast Routing Protocol
ICMP/ICMPv6	Internet Control Message Protocol
IGMP	Internet Group Management Protocol
IP	Internet Protocol version 4
IPv6	Internet Protocol version 6
MARS	Multicast Address Resolution Server
PIM	Protocol Independent Multicast-Sparse Mode (PIM-SM)
RIP2	Routing Information Protocol
RIPng for IPv6	Routing Information Protocol for IPv6
RSVP	Resource ReSerVation setup Protocol
VRRP	Virtual Router Redundancy Protocol

Transport Layer

ISTP	
Mobile IP	Mobile IP Protocol
RUDP	Reliable UDP
TALI	Transport Adapter Layer Interface
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
Van Jacobson	compressed TCP
XOT	X.25 over TCP

Session Layer

BGMP	Border Gateway Multicast Protocol
Diameter	
DIS	Distributed Interactive Simulation
DNS	Domain Name Service
ISAKMP/IKE	Internet Security Association and Key Management Protocol and Internet Key Exchange Protocol
iSCSI	Small Computer Systems Interface
LDAP	Lightweight Directory Access Protocol
MZAP	Multicast-Scope Zone Announcement Protocol
NetBIOS/IP	NetBIOS/IP for TCP/IP Environment

Application Layer

COPS	Common Open Policy Service
FANP	Flow Attribute Notification Protocol
Finger	User Information Protocol
FTP	File Transfer Protocol
HTTP	Hypertext Transfer Protocol
IMAP4	Internet Message Access Protocol rev 4
IMPPpre/IMPPmes	Instant Messaging and Presence Protocols
IPDC	IP Device Control
IRC	·Internet Relay Chat Protocol
ISAKMP	Internet Message Access Protocol version 4rev1
ISP	
NTP	Network Time Protocol
POP3	Post Office Protocol version 3
Radius	Remote Authentication Dial In User Service
RLOGIN	Remote Login
RTSP	Real-time Streaming Protocol
SCTP	Stream Control Transmision Protocol
S-HTTP	Secure Hypertext Transfer Protocol
SLP	Service Location Protocol
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SOCKS	Socket Secure (Server)
TACACS+	Terminal Access Controller Access Control System
TELNET	TCP/IP Terminal Emulation Protocol
TFTP	Trivial File Transfer Protocol
WCCP	Web Cache Coordination Protocol
X-Window	X Window

Routing

BGP-4	Border Gateway Protocol
EGP	Exterior Gateway Protocol
EIGRP	Enhanced Interior Gateway Routing Protocol
HSRP	Cisco Hot Standby Router Protocol
IGRP	Interior Gateway Routing
NARP	NBMA Address Resolution Protocol
NHRP	Next Hop Resolution Protocol
OSPF	Open Shortest Path First

TRIP	Telephony Routing over IP

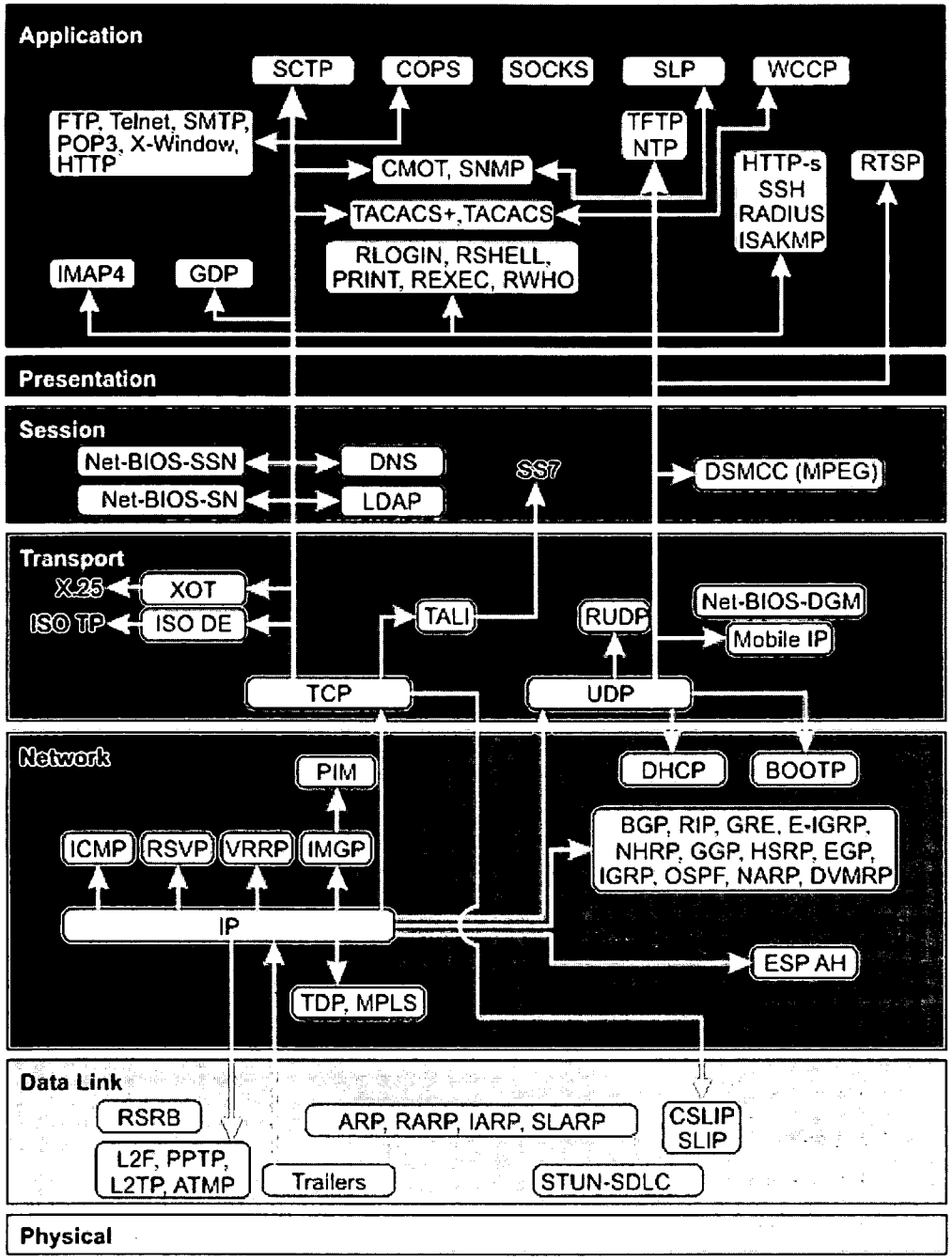
Tunneling

ATMP	Ascend Tunnel Management Protocol
L2F	The Layer 2 Forwarding Protocol
L2TP	Layer 2 Tunneling Protocol
PPTP	Point to Point Tunneling Protocol

Security

AH	Authentication Header
ESP	Encapsulating Security Payload
TLS	Transport Layer Security Protocol

The TCP/IP suite is illustrated here in relation to the OSI model:
Click the protocols on the map to see more details.


Application
SCTP
COPS
SOCKS
SLP
WCCP
FTP, Telnet, SMTP, POP3, X-Window, HTTP
TFTP NTP
CMOT, SNMP
HTTP-s SSH RADIUS ISAKMP
RTSP
TACACS+,TACACS
RLOGIN, RSHELL, PRINT, REXEC, RWHO
IMAP4
GDP
Presentation
Session
Net-BIOS-SSN
Net-BIOS-SN
DNS
LDAP
SS7
DSMCC (MPEG)
Transport
X.25
XOT
ISO TP
ISO DE
TALI
RUDP
Net-BIOS-DGM
Mobile IP
TCP
UDP
Network
PIM
DHCP
BOOTP
ICMP
RSVP
VRRP
IMGP
BGP, RIP, GRE, E-IGRP, NHRP, GGP, HSRP, EGP, IGRP, OSPF, NARP, DVMRP
IP
ESP AH
TDP, MPLS
Data Link
RSRB
ARP, RARP, IARP, SLARP
CSLIP SLIP
L2F, PPTP, L2TP, ATMP
Trailers
STUN-SDLC
Physical

1 2 3 4 5 6 7 8 9 ▶ ▲TOP

TCP/IP Family Protocol Information

AH | ATMP | ARP/RARP | BGMP | BGP-4 | COPS | DCAP | DHCP | Diameter | DIS | DNS | DVMRP | EGP | EIGRP | ESP | FANP | Finger | FTP | HSRP | HTTP | ICMP/ICMPv6 | IGMP | IGRP | IMAP4 | IMPPpre/IMPPmes | IPDC | IP | IPv6 | IRC | ISAKMP | ISAKMP/IKE | iSCSI | ISTP | ISP | LDAP | L2F | L2TP | MARS | Mobile IP | MZAP | NARP | NetBIOS/IP | NHRP | NTP | OSPF | PIM | POP3 | PPTP | Radius | RLOGIN | RIP2 | RIPng for IPv6 | RSVP | RTSP | RUDP | SCTP | S-HTTP | SLP | SMTP | SNMP | SOCKS | TACACS+ | TALI | TCP | TELNET | TFTP | TLS | TRIP | UDP | Van Jacobson | VRRP | WCCP | X-Window | XOT

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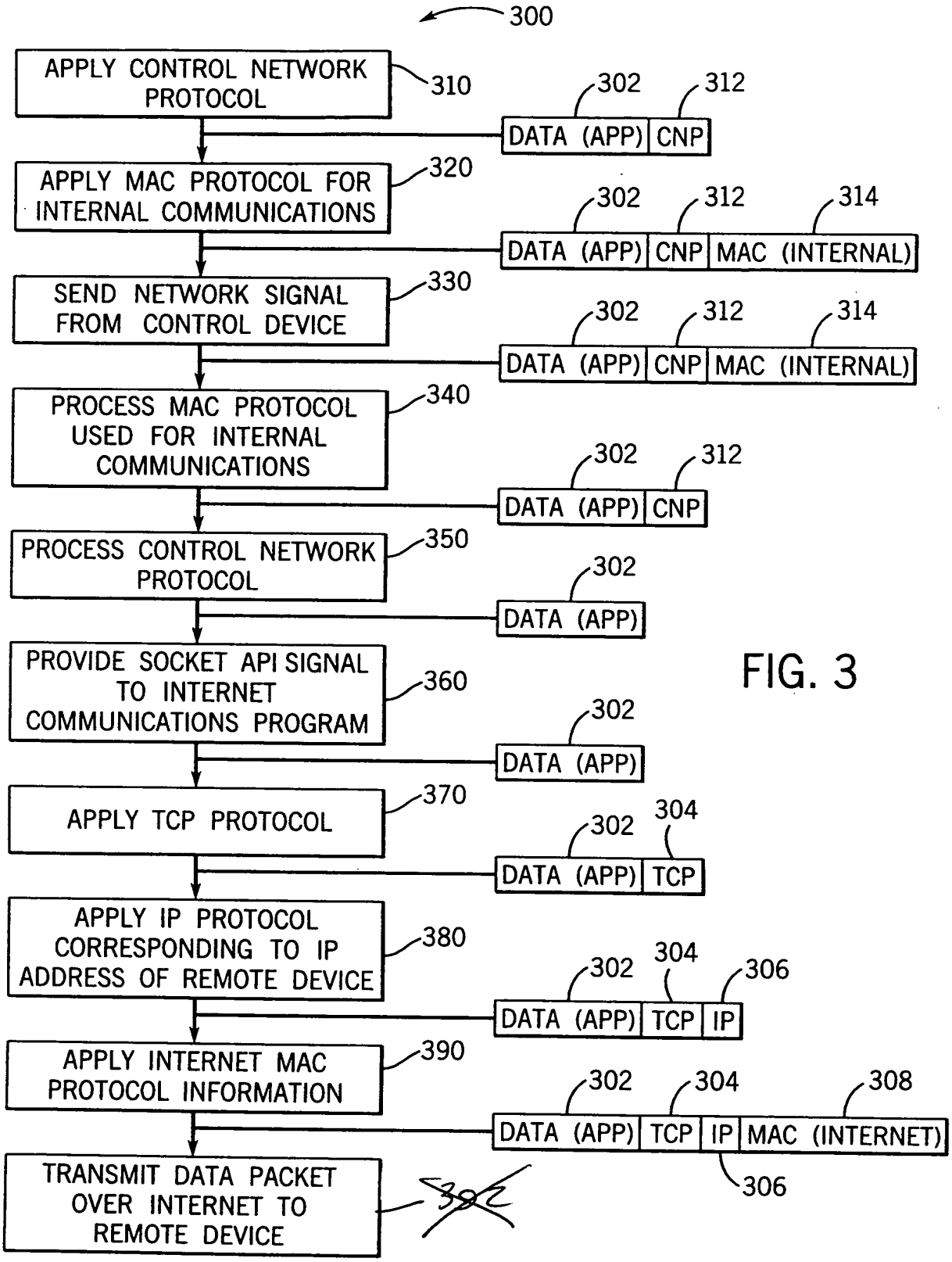

FIG. 3